



AN OBSERVATIONAL STUDY OF HEPATIC ABSCESS DRAINAGE WITH USG GUIDED PIGTAIL CATHETER

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ABSTRACT

Background: Ultrasound-guided pigtail catheter drainage is a minimally invasive technique for managing hepatic abscesses. This observational study aims to evaluate the efficacy and safety of this procedure. It will assess successful drainage, resolution of infection, and incidence of complications. The study's findings could support the use of USG-guided pigtail catheter drainage as a preferred treatment option for hepatic abscesses. **Materials & Methods:** We did an observational study in Department of General Surgery, Darbhanga Medical College & Hospital started in January 2021 to December 2022, 50 patients with liquefied hepatic abscess (>5 cm) underwent percutaneous pigtail catheter drainage under USG guidance. **Results:** Study done on 50 patients, out of them male were 47(94%) and female were 3(6%). The most common age group were 41 to 50 years and 31 to 40 years 26% and 24% respectively. 48 patients had solitary abscess, while 2 had multiple abscesses. 36 patients had amoebic abscess, 12 had pyogenic abscess and 2 had mixed infection. Pigtail catheters under USG guidance were introduced in these patients using the trocar technique. The volume of pus drained ranged from 250 to 1120 ml, while the period of catheter drainage ranged from 5 to 16 days. Complications were minor and included catheter displacement in 2 patients, catheter site infection in 1 patients and catheter exit in 1 patients. There was no mortality associated with this procedure. **Conclusion:** we in our study of 50 patients conclude that USG guided pigtail catheter drainage of hepatic abscesses provides accurate localization, real-time guidance, effective drainage, and favorable patient outcomes. Its advantages, including minimally invasive nature, high success rates, lower complications, low morbidity, no mortality and cost-effectiveness, make it a well-justified and useful technique in the management of hepatic abscesses.

KEYWORDS :

INTRODUCTION

Liver abscesses, whether amoebic or pyogenic, are a major clinical concern in tropical¹ and subtropical regions, accounting for a large number of hospitalisations.

Liver abscesses are serious medical conditions characterized by the formation of pus filled cavities within the liver parenchyma. They can arise from various sources, including bacterial or parasitic infections, intra-abdominal infections, or postoperative complications. If left untreated or improperly managed, liver abscesses can lead to severe complications and mortality.

Traditional treatment methods for liver abscesses include antibiotic therapy and, in some cases, percutaneous needle aspiration or open surgical drainage. However, these approaches may have limitations², such as inadequate drainage, complications, and prolonged hospital stays.

In recent years, USG guided pigtail catheter drainage has emerged as a minimally invasive and effective alternative for managing liver abscesses³. This technique involves the percutaneous placement of a specially designed pigtail catheter into the abscess cavity under real-time USG guidance. The catheter allows for continuous drainage of the abscess, facilitating complete evacuation of pus, and providing a means for instilling antibiotics or other medications directly into the cavity.

There are various advantages of USG guided pigtail catheter drainage. Firstly, it provides precise localization of the abscess cavity, ensuring accurate catheter placement and avoiding damage to surrounding structures. Additionally, the procedure can be performed in an outpatient setting or with shorter hospital stays, leading to reduced healthcare costs and improved patient comfort⁴. The continuous drainage

provided by the catheter promotes faster resolution of the abscess, reduces the risk of recurrence, and potentially minimizes the need for surgical intervention.

Needle aspiration is less expensive avoids problems related to catheter care and long-term hospital care. Multiple abscesses can be aspirated through different tracts in the same sitting.⁵ However, needle aspiration has lower success rate than catheter drainage.⁶ Another problem with aspiration is that repeated needle aspirations (average number per patient ranging from 1 to 5) may be required in a single patient over a short period of time from 5 to 14 days. This may be painful and unpleasant for the patients and hence may not be acceptable to them.⁷ To avoid these problems associated with needle aspiration, percutaneous pigtail catheter drainage is now used as the first tool in the management of liver abscesses.⁸ The advantage of catheter drainage is that it provides a continuous outlet to the pus and hence the problems of incomplete and repeated evacuations are not encountered.⁹

METHODS

An observational study of 50 patients with hepatic abscess underwent USG guided pigtail catheter drainage at department of surgery, Darbhanga Medical College & Hospital during the period from January 2021 to December 2022. Diagnosis of liver abscess was made on basis of clinical history, physical examination followed by USG.

Study cases selected according to following criteria and who give informed and written consent for same. Patients of all age and patients of all gender were included in our study. Patients having abscess cavity size ≥ 5 cm, hepatic abscess refractory to medical management are included in our study. Patients having ruptured liver abscess with features of peritonitis, impending rupture, patients with co-existing coagulopathy,

patients of suspected malignancy are excluded from the study.

Technique:-

For pigtail drainage 14 French pigtail catheter were used under USG guidance using trocar technique. Informed and written consent was taken. Liver abscess located by USG and the site for drainage was marked. Painting and draping were done. Under all antiseptic precautions drainage site was infiltrated with 2% lignocaine. A stab skin incision of 0.5 cm was made at drainage site. Under USG guidance, Pigtail catheter was introduced and positioned into center of cavity, stellate were removed, pus was aspirated and sent for microscopy and culture & sensitivity, stiffener were also removed, pigtail was connected to a uro bag and fixed to the skin. Antiseptic dressing were applied. Metronidazole and ciprofloxacin were given in therapeutic doses for a period of 2 weeks. Weekly USG were done post procedure to monitor the cavity size, volume and to confirm the position of tip of the catheter. Clinical improvement in the patients' condition was noted in terms of relief from pain, fever and decreased WBC count.

The pigtail catheter was withdrawn after the drainage turned serous and either stopped or less than 10 ml in 24 hours, and the USG suggested that the cavity had collapsed without any pus in it. After the catheter removal, sterile dressings were applied. All patients were advised for follow up after 15 days, 1 month and 3 month for assessment clinically and sonographically to see the residual cavity.

RESULT

The research involved 50 patients, 47 of whom were male and three of them were female. The age group of 41-50 years was the most prevalent, followed by the age group of 30-40 years, with a mean age of 45.1 years.

Table 1: Gender distribution of the patients (N=50)

Gender	Frequency	Percentage (%)
Male	47	94.0
Female	3	6.0

Before the treatment, the patients' abscesses size varied from 250cc to 1120cc, with the mean of 536 cc. The mean size of the abscess varies significantly throughout the different follow-up periods. from 536 mL pre-procedure volume to 25.6 mL on the 3rd week of the follow-up period as p-value<0.001 which is significant.

Most of the patients [13(26%)] were from the age group of 41 to 50 years followed by 31 to 40 years [12 (24%)], with mean (SD) age of the patients was 45.14(14.3) years with minimum age 20 years and maximum age of 80 years.

Most of the patients [48(96%)] had complaint of right upper quadrant tenderness and [47 (94%)] had the complaint of hepatomegaly followed by [46(92%)] had complaints of fever.

Table 2: Distribution of the patients according to the clinical symptoms

Clinical symptoms	Frequency	Percentage (%)
RUQ* tenderness	48	96.0
Hepatomegaly	47	94.0
Fever	46	92.0
Anorexia/Malaise	44	88.0
Nausea/Vomiting	14	28.0
Jaundice	5	10.0

The MCC of hepatic abscess in our study was amoebic [36(72%)] after that pyogenic [12(24%)] and mixed infection [2(4%)] respectively

Table3: Cause of Hepatic abscess (N=50)

Type of Abscess	Frequency	Percentage (%)
Amoebic	36	72.0
Pyogenic	12	24.0
Mixed	2	4.0

Table 4: Micro-organism isolated from pus (N=50)

Organism	Frequency	Percentage	Remarks
No growth	36	72%	
E.coli	9	18%	A/w Biliary pathology
K. Pneumonia	5	10%	A/w Diabetics

The patients did not have any significant postoperative problems. One patient had catheter site infection, which was treated conservatively with antibiotics; one patient had their catheter come out through the skin as they switched positions; and two patients had their catheters displaced; these patients had their catheters repositioned under USG guidance.

DISCUSSION

Pigtail catheter drainage is a highly effective and safe technique for the management of hepatic abscesses. This minimally invasive procedure offers several advantages over traditional open surgical approaches, making it a preferred choice in the treatment of hepatic abscess.

Pigtail catheter drainage provides accurate localization and real-time ultrasound guidance, allowing for precise placement within the abscess cavity. This ensures effective drainage and resolution of the infection. The technique has demonstrated high success rates in achieving complete abscess resolution and alleviating symptoms.

By avoiding open surgery, pigtail catheter drainage minimizes tissue trauma, reduces postoperative pain, and enables faster recovery. It is associated with lower complication rates compared to more invasive procedures. The ability to perform the procedure under local anesthesia further enhances patient comfort and suitability.

The technique is versatile and can be utilized for abscesses of various sizes.

Pigtail catheter drainage is also a cost-effective approach, potentially leading to shorter hospital stays, reduced healthcare expenses, and improved resource utilization.

CONCLUSION

Overall, pigtail catheter drainage of hepatic abscesses provides accurate localization, real-time guidance, effective drainage, and favorable patient outcomes. Its advantages, including minimally invasive nature, high success rates, lower complications, low morbidity, and cost-effectiveness, make it a well-justified and useful technique in the management of hepatic abscesses.

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